FEDERAL AVIATION ADMINISTRATION

Final Requirements Document (FRD)

FAA Next Generation Messaging System

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EXECUTIVE SUMMARY

This document contains user and technical requirements that support the acquisition process for a messaging capability to replace the Federal Aviation Administration's (FAA's) current e-mail system. The approaching life cycle end of cc:Mail, the system now used by the agency, drives consideration of this acquisition. Product support by the vendor will end on October 31, 2001, leaving the agency vulnerable to declining reliability and increasing maintenance costs.

The workgroup that developed these requirements sought to address the broadest view of user and administrator needs, as well as security issues related to electronic mail. Thus, these requirements support an enterprise-wide system acquisition, wherein the scope of the enterprise is FAA-wide. This document serves to define the requirements of the FAA that must be met in order to support the effective and efficient execution of the agency's mission. The FAA anticipates a standards-based, commercial-off-the shelf (COTS) solution for the messaging system solution that will interoperate effectively with the Department of Transportation and its operating administrations.

These requirements consider all classes of users ranging from conventional, office-based to highly mobile users. Further, the requirements incorporate messaging technology advancements that promise increases in productivity and the opportunity to leverage information assets.

The users and administrators seek to preserve a uniform messaging environment that provides all of the capabilities of the current system and is easy to use. The users need a reliable, secure, high performance system that will interoperate well with frequently used applications and data resources. Users also require new capabilities in the areas of collaboration, workflow, and calendaring. Notably, users have several requirements that are best supported by a public key infrastructure (PKI). These requirements include the ability to sign, encrypt, and decode messages, and to interoperate with the Defense Messaging System. They also include the use of directory and public/private key capabilities to simplify and streamline access to network and information resources via single sign-on access controls.

Along with requirements that detail system functionality, users have established requirements for training, documentation, and on-line help and tutorials. Users also established requirements for an orderly transition to the new system. This document contains a list of those standards believed necessary to be met in order to assure the highest degree of interoperability with other information technology systems.

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1 PURPOSE

The FAA's existing messaging capability is supported with an application known as cc:Mail. The vendor of cc:Mail has told the FAA that the product will not be supported beyond October 31, 2001. The FAA recognizes the need to replace the current the e-mail system with a next generation messaging capability. The Associate Administrator for Research and Acquisitions, ARA-1, requested the Assistant Administrator for Information Services and Chief Information Officer, AIO-1 prepare a requirements document for the agency's next generation messaging service.

The FAA is seeking a standards-based, COTS, enterprise-wide solution to its electronic messaging requirement that will interoperate effectively with the Department of Transportation and its operating administrations. The requirements in this document should be considered in total when evaluating message system designs or implementations. Many of the characteristics are interdependent and provide the necessary assurances only when applied in combination with one another.

This document establishes user requirements that are the functional capabilities the messaging system must provide to an FAA employee who uses messaging to perform work-related tasks in an office setting, telecommuting, or "on the road" (i.e., remotely). In order to define user requirements without specifically stating messaging system design criteria, a service-level approach is used when possible.

The goal is to clearly detail the types and terms of service, or level of service, that a user can expect within the parameters of messaging. The terms of service will be provided in a "Service Level Agreement" between the users and the system provider. An example of specifying service availability might be: "Service availability is defined as the amount of time the messaging system is available and capable of receiving, sending, and archiving messages from users." The minimum service level requirement might be: "The system must be available 99% of the time on an agreed upon schedule of service."

2 BACKGROUND

The FAA's use of e-mail has matured and expanded considerably in the last half-decade. Indeed, e-mail is one computer-based application that is used by nearly every FAA employee and contractor.

The agency has enjoyed many benefits from consolidating its varied e-mail applications to the single system in use today, cc:Mail. Before consolidation, each FAA regional office and the Washington headquarters operated its own chosen system. Field offices and various regional division personnel who communicated via e-mail frequently had to use two different systems, making it difficult to effectively communicate.

The FAA became a model for best practices through its decision to standardize on a single system. After implementation was completed agency-wide, the number of users grew over 20% per year and message volumes more than doubled annually. What started out as an effort to simplify communications has since fundamentally altered the way the agency does business. Messaging has become a key tool of agency communications, both within the FAA and with outside organizations, including other government agencies and the aviation industry.

The use of a unified system has contributed to organizational cohesiveness and broken down communications barriers across the agency. Regional and headquarters business units are working together much more effectively, and field office personnel are able to coordinate across geographic boundaries in ways that were unimaginable less than a decade ago.

The FAA is now in a position to significantly extend the utility and reach of its messaging infrastructure. cc:Mail has achieved satisfactory levels of reliability and usefulness; however, not all users benefit from the current releases of the cc:Mail product. The users seek a uniform delivery of upgrades, when they become available, as we move forward with the next generation of messaging.

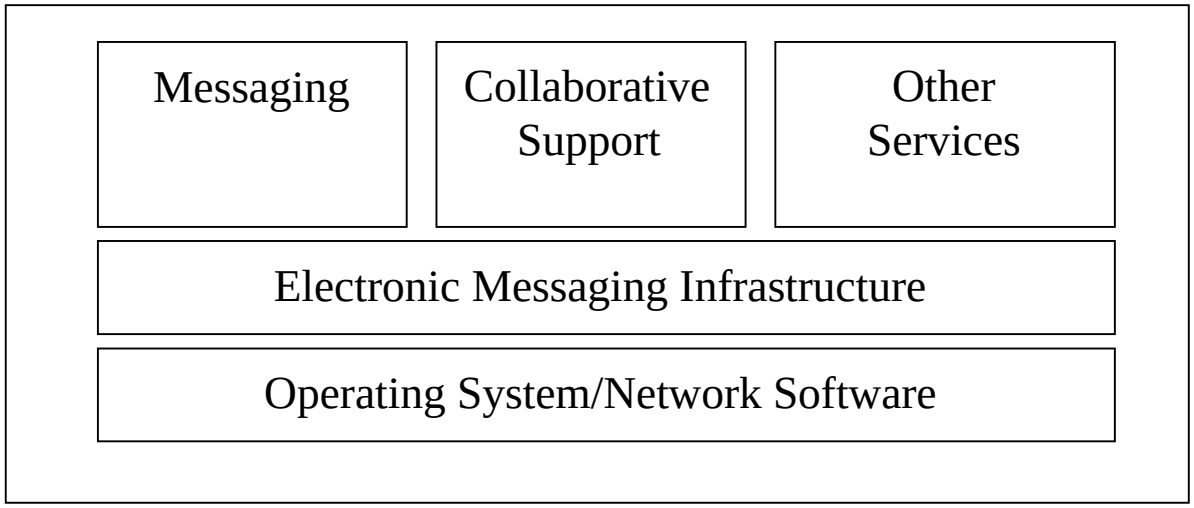
Fortunately, technological advances in electronic messaging and collaboration products offer capabilities that the agency can implement in order to increase efficiency and lower operational costs.

3 OPERATIONAL CONCEPT

The goal for the next generation of FAA messaging services is to preserve the functions that our users rely upon while delivering new capabilities needed to advance agency practices and processes and to stay aligned with emerging messaging capabilities.

The Next Generation Messaging System (NexGen) will continue to provide a uniform messaging environment to support the broad variety of users that constitute the agency enterprise. It will provide the standards-based infrastructure to meet user requirements in areas such as e-mail, group calendars and scheduling, and support for a collaborative workplace among staff members working at geographically distributed locations.

The following diagram depicts the relationship of the messaging infrastructure to the underlying systems necessary for its operation and the services it supports.



Requirements are a way to focus on the services provided by the messaging system and are the first step in defining its architecture and technical requirements. The user interface is a particularly important component of user requirements. "Ease of use" is difficult to describe but it defines or establishes the quality of experience that users will be subject to as they perform duties using messaging as a workplace tool.

There are also considerations on how the system will be operated in order to meet user requirements. Such a consideration is a policy of how the system will be operated to meet the federal requirements for record retention.

The FAA requires the support of two predominant types of user services – ***network-based*** and ***stand-alone***. Users may employ each type of service in the performance of their work. Requirements in this document will generally apply to both messaging types.

FAA users are familiar with network-based messaging services; it is the predominant method of interacting with the messaging system. Most often, users will access their messaging system accounts from the workstation assigned to them. Typically, a user will have the messaging client

application running simultaneously with other applications so the user can be notified when new messages arrive.

Stand-alone messaging services are for a large number of FAA users who travel frequently, domestically or abroad, or have a need to obtain access during off-duty hours when they are at home. Other messaging users work full-time in foreign or domestic locations that are not serviced by a network or telecommuting center.

Stand-alone users connect via dial up from devices ranging from conventional desktops and laptops to sub-notebooks. Some dial into the Agency Data Telecommunications Network 2000 (ADTN2000) and its international extensions using a local phone number. Others use local and long distance commercial carriers to connect to agency-operated remote access services. Other users access their mail over the public Internet using a web-based browser.

Users that travel or are based overseas often encounter slow connection speeds, older protocols, poor or no Internet service, and high long distance costs. Some users remotely deployed in the U.S. encounter similar obstacles.

4 REQUIREMENTS

These requirements represent the broadest view of users. These requirements are for an enterprise-wide system. The "enterprise" is considered to be the FAA. The system must meet the requirements described herein in a manner that fosters interoperability with the DOT and its operating administrations. The types of requirements are user and technical, migration, and training.

User and technical requirements are the requirements necessary to deliver functionality to the users and administration for those responsible for operating the messaging system. These requirements are addressed in three phases.

Migration requirements are the requirements FAA believes are essential for the orderly transition to the replacement messaging system while minimizing the impact upon users. These requirements shall be met in phase I.

Training requirements address training needs necessary to effectively train users and implements the next generation messaging system within the FAA's diverse workplace. These requirements shall be met in all three phases of the program.

The user and technical, and training requirements are presented in all three phases of the NexGen program. Migration requirements are addressed in Phase I. The three phases are:

Phase I requirements are those features that exist in the current system and/or have been ranked as critical in conducting the FAA's day-to-day business. The performance requirements in phase I are either based on known current system performance; or FAA's knowledge of industry capability.

Phase II requirements are those features, such as collaboration, that are presently in limited use or are not supported in the current system but were ranked as highly important by a large majority of users. These requirements may be met in phase I.

Phase III requirements are those that were ranked high by a smaller segment of the FAA and generally employ technologies that are still emerging in the marketplace or are not yet supported by open standards.

5 PHASE I MESSAGING SYSTEM REQUIREMENTS

5.1 Messaging System Features

The messaging system shall:

- Be standards-based.
- Provide users access to their messaging accounts from anywhere inside or outside the FAA's enterprise messaging system via available connection methods (providing that they use their assigned identification and authentication methods), from any conventional desktop and laptop computers, at any time.
- Have the ability to send/receive messages to/from anyone who uses a different messaging system, either inside or outside the FAA.
- Provide easy methods for users to delegate, or redirect, their inbox processing to others.

5.2 Legacy System Features

The FAA currently deploys the cc:Mail product agencywide. Users require that the following features, currently available within cc:Mail Version 8.5, be available in the Next Generation Messaging System. Existing messaging system features include:

- An encrypted data store
- Personal, user-created folders
- User archives
  - ➢ External to the mail systems' message store
  - ➢ Portable from one account to another
  - ➢ Ability to add and delete from archives
- Save messages in ASCII text readable format
- User-created address lists
  - ➢ Not limited by the number of recipients
  - ➢ Able to include both EMAIL system addresses and Internet EMAIL addresses
  - ➢ Ability to include groups or other mailing lists
- Forward and auto reply capability
- Message forwarding history
- Selectable return receipts
- Remote access, off-line message management, and mailbox synchronization
- Message preview
- Spell check

- Remote access to the mail system using a variety of communications vehicles, methods, and protocols
- Bulletin board support
- User-controlled filtering and message manipulation rules providing automated archiving, forwarding of, and response to, messages, etc., whether the client is off-line or on-line and should support user initiation and be server-based.
- Type-ahead addressing
- Display list of available addresses as address is entered
- Allow selection of addresses from a list of addresses
- Allow attachment of text files and non-EMAIL documents
- Access to an event log of actions that have been accomplished (either in the background or by the system)
- Interoperability with installed office automation applications
- Capability to interoperate with non-messaging system applications. This capability may be implemented using either of the following methods:
  - ➢ Launching the application seamlessly from within the messaging application, and/or
  - ➢ Converting or capturing external application data and, after manipulation, saving the data in the originating external application's format, or by providing facilities to return the data to its original form.
- Ability for users to view attachments from within the messaging application even if the attachment is in one of a number of foreign application formats and the foreign application is not installed or available to the user. (See Lotus Customer Support Technote Number 155286 dated 09/28/98; Product Area: cc:Mail for Windows; Product: cc:Mail for Windows 6.x; Topic: Workstation/Desktop\\Install/Load/Run\\Issues Installing Product)
- Ad hoc search capabilities. Users shall have query-building features that assist the user in finding the desired information. The search capability shall include all database fields in the message store, including text string searches across the database and within individual messages.
- The user interface shall support Windows 95+, NT 4+, and Macintosh OS 8+

5.3 Access/Connectivity

- The system shall be capable of providing messaging service 24 hours, 7 days per week and meet the reliability requirements defined in this document.
- The system shall provide the following access:
  - ➢ On-line Access - Users must have access from a desktop via a local area network (LAN), TCP/IP protocol, and dial-up through modems using conventional Internet.

  - ➢ Stand-alone/Off-line Access - The ability to conveniently work with e-mail off-line is necessary. Connectivity for stand-alone users shall be robust and reliable. A choice of connections shall be available allowing users to work off-line as well as on-line, from anywhere in the world. The system will provide the same functions and features available in either mode, including access to the current directory and all messages.

- The system shall have the ability to synchronize a user's messages from the central message store to multiple stand-alone computers (i.e., laptop, desktop, palm pilot). The system shall allow users to select for synchronization read or unread messages, or both. The synchronization of messages and directory names shall be rapid and easy for users to accomplish.
- The user must have the option of reviewing other inbox messages in the foreground while an attachment is being downloaded in background. The user must also have the ability to view messages with or without attachments or the attachments sent without message text.
- The system shall provide laptop users with the ability to support multiple user profile accounts, i.e., one for home, hotel, or office. The stand-alone user shall be able to select the type of connection as needed. The stand-alone client shall be flexible and have configurable settings for customizing to each user's preference
- Users shall have the option to access their account using a web browser.
- The system shall provide standards-based support to exchange messages with external messaging systems. There shall be no loss of functionality when messages transit between different providers and users shall be able to interconnect seamlessly with multiple service providers.
- The system shall support a single client application that provides for access to e-mail via Web/Intranet in addition to POP3, IMAP, and desktop/LAN.
- The stand-alone client shall be able to:
  - ➢ Monitor progress of data exchange with server
  - ➢ Perform "selective" data exchange based on user criteria that can be preset and include an ad hoc option that can be recalled as necessary
  - ➢ Synchronization with server in background process

5.4 Calendaring and Scheduling

- The system shall provide a calendaring/scheduling capability that permits a user's individual, group, or resource schedule to be accessible at any time, from any medium.
- The system shall provide the ability to schedule services and resources throughout any level of the FAA for network-based users. Included is the ability to set up appointments for individuals, groups, or events and reconcile appointment conflicts automatically for users within a workgroup.

5.5 Directory

- The system shall provide a means for users to add addresses from non-FAA organizations or individuals to their private directory in support of the messaging solution.
- The system shall support multiple Internet access points. The FAA currently has at four domains for Internet messaging which include: FAA.Gov; FAA.DOT.Gov; TC.FAA.Gov; and MMACMAIL.JCCBI.Gov. The system shall support the FAA's established naming convention in accordance with Internet addressing standards, i.e., john.smith@faa.gov.
- The directory shall have the ability to create and store a variety of mail distribution lists, including private lists, departmental group lists, or project user and have the ability to nest lists. The nesting of lists is the ability to create mailing lists containing other mail lists as its members (i.e., lists of lists). The system shall allow mail lists to contain an unlimited number of addressees and accurately deliver messages to large address lists.
- The directory shall be standards-based, support X.500 (DAP), and be interoperable with Lightweight Directory Access Protocol (LDAP) standards. The directory must be compatible with and able to access other messaging directories.
- Users shall be able to synchronize their stand-alone devices with the master directory using a minimum of time on-line. The system shall provide delta updates or full directory synchronization.

5.6 Delivery and Message Notification

- The system shall provide an automatic response capability that users may activate when they will not be answering messages for a period of their choosing, for example, when the user will be out of the office. The capability shall allow users to author a customized response and select filters that determine which message senders are to receive the notification.
- The system shall provide for return receipts when requested by a sender.
- The system shall notify message originators on non-delivery of their messages.
- The system shall notify a user visually or by sound, at the user's choice, when a new message arrives.

5.7 Message Retention and Organization

There are three reasons to preserve messages: to support the decisionmaking needs of the agency, to preserve the intellectual assets of the agency for possible future reference, and to comply with legal and regulatory requirements.

Users shall be able to automatically move, delete, forward, and/or respond to messages based on user and technical criteria, regardless of status of their client workstation, as follows:

- Routine Preservation

- ➢ The system shall support the routine preservation of messages and attachments.
- ➢ Users shall be able to selectively move messages in or out of the message store or delete messages based on criteria of their choosing.
- ➢ Users shall also have the ability to schedule management tasks for automatic execution.

- Message Organization
  - ➢ Users shall have the ability to organize messages (both sent and received) into folders and/or archives, including the ability to copy to and from, move between, and delete from all such locations.
  - ➢ Users shall have the ability to sort messages and query by any defined field and to search any storage locations by query definition.
  - ➢ Users shall be able to retain deleted messages in temporary storage locations and recover such messages within user or administrative defined period of time.

5.8 Interoperability

The system shall provide connectivity to gateways and interoperate with other vendors messaging solutions and have the ability to exchange messages and interoperate with external organizations' systems. Interoperability requirements include support for the full range of operating systems, network operating systems, and server platforms in use or planned for by the FAA.

The FAA recognizes that it is not reasonable to require interoperability with the broad range of proprietary and niche products on the market. Therefore, the agency requires the capability to interoperate with open, non-proprietary standards. The agency is currently aware of the standards listed in Section 5.14.1.

5.9 Security

- Confidentiality, integrity, and availability commensurate with the sensitivity level of information and system components. All message traffic shall be an integral part of the system. The system shall provide encrypted message stores and encrypted message transport for all messages. This must include physical security (e.g. access to mail servers, hardware, software) and personnel security.
- The messaging system shall maintain and permit user review of all recipient lists, originator postmarks, and forwarding histories as a part of the message. This information shall be protected from unauthorized access, disclosure and modification. This data shall be non-erasable and exist as an integral part of the message when it resides within the messaging store and be available when the message is exported or stored separately from the message store.
- The system shall provide access controls for individual mail accounts that prevent unauthorized use. Access controls must also be implemented on administrator tool, systems hardware and software, and data backups. The system shall provide access controls and user authentication and validation services that:

- Allows for multiple levels of authentication and identification with differing amounts of factoring for users and administrators.
- Presents the user with a login or user authentication screen prior to displaying any system application, data or other information about the system.
- Allows insertion of an FAA warning banner or message on the login or authentication screen.
- Requires all users to enter an appropriate validation response such as a logon ID and password. Other validation schemes are permitted as long as they adequately and securely authenticate users, allowing only authorized user access to the system.
- Prevents the user from saving their password or validation key in a script file to automate the logon process. The system must force the user to enter their password or validation key for each logon attempt.
- Requires the aging of all user and administrator accounts. Account passwords or other validation keys shall expire after a specified period of time and require the user to enter a new password or validation key. The system shall not allow the user to reuse the last 5 passwords or validation keys
- Requires that user accounts that remain inactive for a selected length of time be locked automatically by the system. The administrator may unlock the account only after re-authorizing and re-validating the user's identity.
- Limits access to predefined and authorized users only.
- Permits only the administrator to create, modify, delete or unlock user accounts.
- Authenticate all requests to access the email, calendar and other applications prior to allowing connection to the applications.
- Encrypts the user authentication and validation process, i.e. does not allow clear text logons.
- Unauthenticated users shall not be allowed access to any system application or resource.
- All system access methods whether network, standalone, remote dial-in, or web must present the user authentication screen as the first screen, and authenticate all users.
- Limit the number of attempted logons to the system, and locks the user account when the limit is exceeded.
- Permit only the administrator to unlocked accounts.
- Allow the limits to be determined and set by the administrator through a configurable parameter.
- The vendor shall provide anti-spamming capabilities which allows administrators to:
  - apply controls to the messaging system that will block receipt of messages into the system.

- apply controls based on content, recipient identification, sender identification, sender post office, or other selectable parameters.

- The system shall provide for non-repudiation of messages, actions and events within the system. Non-repudiation must ensure that a message, action or event can directly be associated to a specific user without a doubt.
- Auditing and logging capabilities shall be an integral part of the system, and accessible only to the administrators. Examples of logged events include attempted and successful login requests, creation and deletion of accounts and locks placed on accounts, etc.
- The message store database shall have backup capability.
- The system shall have recovery capabilities and processes to recover from system crashes, data or file corruption, deleted messages, and other unusual events. This capability shall be available to the administrators.
- The system shall be capable of recovering deleted, encrypted, and other private communications between users. This recovery capability and process shall be available only to individuals with special credentials, such as law enforcement or the accountability board.
- The vendor shall offer security-related training for administrator and support personnel. The training may be separate or incorporated in to the administrator training described in section 5.16. The training must address security features of the system and proper implementation of the features. It must also address how to upgrade the system and apply patches, and assure that security is maintained.
- The vendor shall make available to the FAA, all system upgrades, updates, patches, fixes in a timely manor.
- The vendor shall notify the FAA immediately of all security-related vulnerabilities identified in the system or its components.
- The vendor shall provide all components necessary to securely operate the key management station associated with PKI and the digital signatures.
  - The vendor shall provide recommendations on quantity, location, placement, deployment, and operation of the key management stations.
  - The vendor shall assist the FAA with development, deployment, and setup of the infrastructure necessary for the key management station.
- The system shall utilize secure message protocols where possible and applicable for all applications.
  - Secure authentication protocols shall be used during the logon and validation process. Clear or plain text authentication of users shall not be permitted.
  - Secure message exchange protocols shall be utilized for all network and Internet message exchange.
  - Dial in connection shall be made using secure dial-in connection protocols. Clear or plain text authentication shall not be permitted.

5.10 Virus Prevention

The vendor shall coordinate with the FAA Computer Security Incident Response Capability (CSIRC) in provisioning appropriate anti virus software for use with the system. The CSIRC has overall agency responsibility for antivirus protection.

- The anti virus software shall allow messages to be scanned prior to encrypting, sending, and upon receipt.
- Messages and attachments shall be virus free as they are delivered.
- The vendor shall ensure that all software, patches, fixes, and upgrades provided to the FAA are free of viruses before delivery to the FAA.
- The vendor shall provide on a regular basis and in a timely manor, updates to the anti virus software virus definitions.

5.11 Defense Messaging System (DMS) Conformance

A small set of users will require the ability to interface with high-level security features of the DMS. The system, for this set of users, shall employ security-hardened hardware and software and network components that are approved by the Department of Defense (DOD) and can pass acceptance testing required by the DOD. FAA users shall be able to communicate with DOD users that have the medium grade messaging (MGM) components of DMS.

5.12 System Administration

- The messaging system shall allow the system administrator to monitor message traffic in a distributed enterprise messaging system from a single point and provide user and system statistics (i.e., track space usage).
- The messaging system shall allow 24 x 7 access for both administrators and end-users.
- The messaging system shall allow comprehensive administration locally and from a remote location, to include:
  - ➢ Post office maintenance
  - ➢ Message routing
  - ➢ User and system administration
  - ➢ Database replication and backup
- The messaging system shall provide the following:
  - ➢ Server and client-based rules
  - ➢ Uninstall capabilities for the client
  - ➢ Ability to prioritize a message
  - ➢ Ability to schedule message delivery time
  - ➢ Ability to store personal settings locally and on the remote server
  - ➢ Ability to limit message storage space for each user

- ➢ Web-based administration
- ➢ Ability for administrators to age e-mail for deletion
- ➢ A system that does not alter existing directory services trees and the ability to customize routing between post offices
- ➢ An unlimited number of users per post office
- ➢ Ability to have an unlimited message store
- ➢ Ability to transfer mailboxes between post offices
- ➢ Graphical user interface (GUI) management tools
- ➢ Ability to restrict the access level for each post office
- ➢ Ability to set an alias for an end-user
- ➢ Ability to customize the synchronization of the post office directories
- ➢ Ability to limit the size of messages through the message transfer agent
- ➢ Ability to manage and filter incoming Internet mail
- ➢ Ability to construct rules to automate management processes
- ➢ Ability to recover a single mailbox and reestablish the recovered mailbox without taking the database off-line
- ➢ Ability to support remote users with the capability to selectively process messages to/from the client based on size, type, and author
- ➢ Ability to support remote users with directories (to include partial directories) while disconnected from a server

5.13 Stand-alone Maintenance

The stand-alone user, particularly the user who never connects other than by dial up, must administer/maintain his/her own message and directory stores. This requires these users, who are not computer professionals, to maintain their own system. Often this must be done with infrequent or nonexistent technical support. Therefore, stand-alone user messaging system applications shall provide menu-driven maintenance utilities. These utilities shall have well documented on-line help that also exists in a printed form that is easily transportable by a traveler. Maintenance software and documentation shall be updated periodically in order to parallel the capabilities of the network-based administrators.

5.14 Technical Requirements

This section contains the various standards and protocols with which the FAA is familiar and shall be considered the minimum acceptable set for this Next Generation Messaging System. It shall be the responsibility of the vendor to maintain awareness of any changes to these standards and compliance with these changes. The vendor shall make the FAA aware of new standards affecting this system should they appear prior to completion of the installation and subsequent turnover to the FAA.

5.14.1 Standards

- X.400 Messaging Standard Protocol - Standard messaging application layer protocol that has been defined to run over various network transports including Ethernet, TCP/IP (Internet), and dial-up lines.
- Lightweight Directory Access Protocol (LDAP) - Protocol used to access a directory listing. It is used to query an LDAP compliant directory (including an X.500 directory). It is expected that LDAP will provide a common method for searching e-mail addresses on the Internet, eventually leading to global white pages.
- X.500 directory access (1993 version) - Protocol for managing on-line directories of users and resources. It can be used to support X.400 and other messaging systems, but it is not restricted to e-mail usage. It provides a hierarchical structure that fits the world's classification system: countries, states, cities, streets, houses, families, etc. The goal is to have a directory that can be used globally.
- Simple Mail Transport Protocol (SMTP) - A TCP/IP protocol that defines the message format and the message transfer agent (MTA), which stores and forwards the mail.
- Multipurpose Internet Mail Extensions (MIME) - Common method for transmitting non-text files via Internet e-mail, which was originally designed for ASCII text. MIME encodes the files using one of two encoding methods and decodes it back to its original format at the receiving end.
- Post Office Protocol 3 (POP3) - Standard mail server commonly used on the Internet. It provides a message store that holds incoming e-mail until users log on and download it. POP3 is a simple system with little selectivity. All pending messages and attachments are downloaded at the same time. POP3 uses the SMTP messaging protocol.
- Internet Message Access Protocol version 4 (IMAP4) - Standard e-mail server expected to be widely used on the Internet. It provides a message store that holds incoming e-mail until users log on and download it. IMAP4 is the latest version. Messages can be archived in folders, mailboxes can be shared, and a user can access multiple mail servers. There is also better integration with MIME, which is used to attach files. For example, users can read only the headers in the message without having to automatically accept and wait for attached files that they do not want to download.

5.14.2 Protocols

At a minimum, the messaging system should be capable of handling the following protocols:

- TCP/IP Protocol Suite
- Async
- Standard IEEE 802.3 (Ethernet)
- Secure authentication protocols

- Secure message exchange protocols

5.14.3 Platforms

The list below reflects the current operating systems used by the FAA at the server and client levels. At a minimum, the messaging system shall interoperate with the server platforms and will run on the client platforms noted below.

- Server Platforms
  - ➢ Unix (Sun Solaris, HP UX, IBM AIX, SGI)
  - ➢ Windows NT Server 4.0, service pack 5 or later
  - ➢ OS/390
  - ➢ Linux
  - ➢ Novell Netware 3.2 or later
- Client Platforms
  - ➢ UNIX (desired but not required)
  - ➢ Macintosh PowerPC, OS 8 or later
  - ➢ Windows 95 or later
  - ➢ Windows NT 4.0, service pack 5 or later

5.14.4 Network Management

The NexGen Messaging System shall provide tools for monitoring and reporting on the status of the messaging infrastructure. In addition, the NexGen Messaging System shall support network management in compliance with TCP/IP SNMP standards. Presently, the FAA has implemented the following SNMP compliant packages:

- HP OpenView
- Tivoli TME-10
- SunNet Manager

5.14.5 Scalability and Routing

The messaging system shall be capable of the following:

- Scalability
- Scalability to SMP hardware
- Clustering/load balancing
- Automatic message store failover
- Multiple routing capability
- Selective routing/workflow routing

5.14.6 Performance Requirements

The following assumptions were made for the performance requirements in this section:

- The average message size (less attachments) is 2k.
- The average message size with attachments is 38k.
- The typical message store per user is approximately 30-50 MB, not including message archives.
- The average user generates 200 messages per month.

5.14.6.1 Database Recovery

Upon failure of an individual user's mailbox, the system must support full restoration within 3 hours in Phase I, with a goal of 30 minutes, regardless of post office size. (This requirement is based on current message system performance.)

5.14.6.2 Message Access

- Network-based users (This requirement is based on current message system performance.)
  - ➢ In response to a user's request for access to the messaging system, the messaging system shall display a message summary screen within 5 seconds after entry of login information, with a goal of 2 seconds or better.
  - ➢ In response to a user's request for access to a message, the messaging system shall present the message for viewing within 5 seconds of selecting it from summary screen, with a goal of 2 seconds or better.
- Stand-alone Users (This requirement is based on current message system performance.) - The remote/dial-in user experiences varying access times that are dependent upon the communications path used. Once the connection between the remote user has been established with the post office, download of new messages and directory synchronization shall begin within 5 seconds, with a goal of 2 seconds. After all messages have been downloaded, access time to a locally stored message shall be 2 seconds or less.

5.14.6.3 Delivery Performance

The size of the message store, individual user accounts size, volume of traffic, or message size shall not adversely affect system responsiveness. The goal of the NexGen Messaging System is to provide a capability of delivering messages to users throughout the FAA's Intranet system within 15 minutes. (This requirement is based on FAA's knowledge of industry capability.)

5.14.6.4 Reliability

The system shall be capable of providing users at least 99.5% reliability with a goal of 99.8% reliability as measured by subtracting the failure rate from 100% (scheduled availability). The failure rate is the failed time divided by scheduled available time,

expressed as a percentage. Scheduled downtime cannot be programmed into electronic messaging capability. Reliability levels shall be achievable during migration to the new system, including the conversion of legacy system messages in inbox, folders, and archives. (This requirement is based on FAA's knowledge of industry capability.)

5.14.7 Administration and Maintenance

Message system administration and maintenance functions shall not impact the users' ability to create, send, and receive messages or execute other functions deemed important to conduct business. The impact of any such functions shall not noticeably reduce performance for the user and shall be a measurable performance quality, managed as a service-level requirement.

5.15 Migration Requirements

The overall requirement is to migrate to the new system without losing users' information. During migration, all legacy and next generation clients (network-based and stand-alone) shall be able to access any available system (cc:Mail and/or NexGen Messaging System).

- Include cc:Mail Messages and Archives
- Migration from cc:Mail: Users' messages and individual archives shall be imported into the new system without losing user information, attachments, addressee, content, formatting, and folder location and have the ability to import existing archiving. Migration shall not impact the user or mail administrator where the existing "cc:Mail" message store would require "pre-conversion." The new system shall accept the existing messaging store and archives and directly import them.
- Collaboration
  - ➢ The system shall provide connectors or tools that provide interoperability between the NexGen scheduling and calendaring features and the various scheduling and calendaring applications in use by agency organizations.
  - ➢ Stand-alone clients shall be able to participate in all bulletin board, distribution list, and shared folder updates.
- Directories
  - ➢ The system shall provide a directory synchronization capability to assure that legacy and NexGen directories maintain alignment throughout the transition. The synchronization capability shall also support multiple Internet addresses for individuals throughout the transition.
  - ➢ Conversion of personal address books and mail lists shall result in no loss of information and shall retain similar references (names), i.e., personal address book and mail lists.
  - ➢ Stand-alone clients shall be able to participate in all directory updates.
- Interoperability
  - ➢ The system shall have the ability to exchange messages with existing FAA legacy messaging systems to provide for an orderly migration. The new messaging system

shall have the ability to exchange messages in concurrence (parallel) with cc:Mail while systems are being migrated.

- ➢ The system shall support the orderly transition from the legacy system's multiple domain gateway structure to multiple Internet entry points under a single domain.

5.16 Training

Training at the system administrator level, to include, but not limited to, administration, management, configuration, tuning, and troubleshooting of the message store and its components, is required.

User training shall be delivered in a manner that maximizes learning transfer. The time elapsed between completion of training and the user's transfer to the new system shall not exceed 5 workdays.

The training requirements shall also apply to stand-alone-based user client software. Because the stand-alone users may potentially be required to perform maintenance on their directory and message stores, additional training shall be provided for the unique needs of this type of user.

- **On-line Help**
  - ➢ On-line help shall be easily selectable and, to the maximum extent, be within the context of the task that a user is trying to execute.
  - ➢ On-line help shall have an index and search engine for quickly finding a subject and use hyperlinks and bookmarks to quickly display and save references to desired information.
  - ➢ On-line help shall be available for all tasks, functions, and features of the messaging application.
- **User Manuals**
  - ➢ A printed set of user manuals shall be provided to every FAA location. The vendor shall also provide technical, user, and supporting documentation on a separate CD-ROM and provide a hypertext search engine for quickly locating topics, information, and tutorials, as needed by the user.
  - ➢ Additionally, user manuals shall be accessible at each site in electronic form to each user.
  - ➢ The FAA shall have rights to copy for its use all documentation provided by the vendor.
  - ➢ Electronic manuals shall be updateable and revisable by the vendor or the FAA.
  - ➢ Separate, easily transportable manuals, that include unique maintenance functions, shall be available for stand-alone users.
- **On-line Tutorials**
  - ➢ Tutorials shall cover the most common tasks and be interactive in order to maximize learning transfer. Tutorials shall provide hypertext on-line help files.

The user shall have the ability to bookmark, or preserve, a stopping point within the tutorial and easily return to that section.

- ➢ Each major function of the messaging application shall be accompanied by an on-line tutorial showing visually (movie or animation) how to perform the task.
- ➢ Web-enabled documentation shall have similar features.

6 PHASE II MESSAGING SYSTEM REQUIREMENTS

The FAA requires new capabilities not found in cc:Mail. In particular, the agency requires the new system to support digital signatures, encryption, and a robust directory service, all of which can interoperate with systems used by external organizations and individuals. Further, the majority of agency organizations have new requirements for scheduling, calendaring, collaboration, workflow, and document sharing support. Some new requirements arise from the FAA's need to facilitate its compliance with regulations governing electronic message record retention and archiving.

6.1 Messaging System Features

- The system shall extend the phase I messaging features to support collaborative activities, faxing, and scheduling and use a single (unified) user interface (UI). The system shall additionally support a UNIX workstation client.
- The system shall support ad hoc search capabilities that include text proximity searches across the database, within individual messages, and any attachments.
- The system shall have the ability to use a mouse to make a selection and to call up a tutorial or hyper-link to a Web site. The system shall be able to bookmark and save preferred selections for easy recall at a later time. On-line help (documentation) and tutorials shall be available within the client and via Web interfaces.

6.2 Access/Connectivity

- The system shall support portable devices that are emerging in the marketplace. The system shall have the ability to redirect messages to alternate client devices such as text pagers, handheld digital assistants (PDAs), smart-phones, cellular phones, and other (smaller than laptop/notebook) portable messaging devices that can receive and display limited text.
- The system shall have the ability to support communications to wireless devices through an appropriate service provider.
- The system shall support user-controlled pager notification that alerts them when new messages arrive. A user capable of receiving text pages shall be able to elect that the message, message sender, and/or subject be forwarded.
- The system shall provide the look and the feel to web browsers which closely emulates the typical workstation application user interface, to the extent allowed by the browser in use, with no loss of functionally.
- The system shall support least-cost routing for messages that transit through multiple messaging services.
- A stand-alone user shall be able to selectively view a portion of the text of messages without downloading attachments. Stand-alone users shall have access to all messages, including those previously opened and read on a different client.

6.3 Collaboration, Workflow

A majority of FAA users require the system to support collaboration, workflow, discussion groups, scheduling, calendaring, and document sharing. The features provided to meet this requirement shall integrate seamlessly into the user interface and use the same directory service.

6.3.1 Collaborative Calendaring and Scheduling

The agency objective is to establish a single, uniform, agencywide capability.

- The scheduling functions shall be scaleable enough to support all FAA users.
- Stand-alone users or users in a remote field office shall have the same level of support that exists for network-based users. The stand-alone client shall be able to provide free time scheduling of other users for meetings.
- The system shall support the ability to schedule individuals, groups, and resources using other vendor applications during migration or when coordinating activities with those outside of the FAA.
- A user shall be able to see another users "free time" and availability when scheduling a meeting. Users shall have the option to limit the visibility of scheduled time and access to a single user, group of users, project, or anonymous users. The system shall support accepting, declining, delegating, and rescheduling of requested meetings.
- The system shall support standards-based calendaring.
- A scheduled event shall be able to send notification of availability and to notify users of time conflicts.
- The system shall support instant messaging and presence detection within the FAA. Optionally, it shall be able to interoperate with external systems. Presently there is no standard in place, but the system shall be capable of being enhanced to accommodate the Internet Messaging and Presence Profile (IMPP) that is being developed by the Internet Engineering Task Force.

6.3.2 Shared Folders

- The system shall provide support for shared folders. The system shall have:
  - ➢ Private folders, with the options to share a folder with one person or a group
  - ➢ Shared bulletin board style folders, with the ability to selectively subscribe
- The shared folders shall be able to support access controls for folder creation and deletion, content creation, modification, removal, navigation and searching, remote access and synchronization, and control delegation. The system will have the ability to automatically send notification when documents change or are added.
- Users shall be able to easily replicate folders and to contribute content without requiring format conversion.

6.3.3 Document Management

- The system shall provide for the efficient team authoring of documents and revision tracking database tools, including digital certificate-based authorization, revision control, and multi-user document access and editing controls.
- The system shall support ad hoc searches throughout the messaging, directory, schedule, calendaring, and collaboration databases.
- The document management features shall include, but are not limited to, the ability to:
  - ➢ Mark documents and messages by project, organization, and user
  - ➢ Maintain a revision history of all changes and addressees
  - ➢ Store and retrieve managed items stored in off-line facilities
  - ➢ Include all media as a managed document: fax, video, scanned items, messages, threaded discussions, and calendars

6.3.4 Forms and Routing

- The system shall provide the ability to create, store, route, and manage forms.
- Users shall be able to create forms that have features such as: error checking, field validation, criteria lists, selectable routing, security, and inclusion as a managed document. The design of a form shall not be limited to the number of fields or customizable fields.
- The system shall provide for non-sequential routing and exception handling that can redirect routing if time-sensitive actions are not completed within set parameters. The system shall support role-based routing and form numbering uniqueness.
- The messaging system shall allow users to add functions to the messaging system and directory services via standards-based (API) enhancements.
- When exchanging data between servers that have shared data, the exchange shall not require the entire form (and all the data in the form) to be transmitted. Only the "changed data" shall be transmitted. This is in order to save time and telecommunications costs.
- The system shall execute forms data exchanges (transfers) with the server at the same time as messages. For example, forms data exchange should not require a separate data exchange process, especially for stand-alone clients.
- The user shall be able to do full text searches of workflow and document databases on the host, as well as remote servers, with full security intact.

6.3.5 Workflow

- The system shall support workflow processing and take advantage of digital signatures in order to provide integrity, assure data privacy, and eliminate the need for physical signatures. The system shall support the routine preservation of collaborative work products.

- Workflow routing shall offer all phase I functionality, offer process-definition tools that allow the user to use their preferred process-flowcharting paradigm, and shall allow for a common definition of process modeling.
- Users shall be able to send tasks sequentially and/or simultaneously to multiple addressees and have the option to block forwarding of the document/message to persons or mailboxes not defined in the workflow process. The system's functionality shall include the ability to specify deadlines and priorities, determine whether tasks have been accepted, rejected, delegated, or completed, and build automated context trails that link objects to actions as they are performed on.
- Users shall be able to query and track task assignments and be notified if scheduled deadlines are not met. The system shall be configurable to automatically redirect tasks.
- The system shall provide for rapid synchronization of calendaring, workflow, and documents in a manner that is easy for users to accomplish.
- The system shall be able to support sending and obtaining multiple approvals (digital signatures) from multiple individuals of a workflow item.
- Web clients shall be able to fully participate (as a desktop client) in workflow sequences/applications.
- The system shall have the ability to host discussion databases.

6.3.6 Threaded Message Handling

The system shall provide the ability for users to view messages in order of subject and in the sequence they were generated. This feature eliminates the need for users to include the content of the message they are responding to, reducing overall message traffic. Users shall be able to easily select the preceding or following messages.

6.4 Directory

- It is the FAA's objective to establish a reliable directory service that has the effect of a single directory. This means that messaging system users must see the same directory contents agencywide. The messaging directory shall provide a means of assuring that all users see the same content agency-wide. The directory service will present accurate and current information to those using various messaging client interfaces, scheduling/calendaring, and workflow applications. The directory service shall be accessible and easy to search from all messaging system applications.
- The directory shall be standards-based, support X.500 (DAP), and be interoperable with LDAP standards. The directory must be compatible with and able to access other messaging directories and data systems that support these standards.[1]
- The system shall provide for convenient transfers of non-FAA organizations' or individuals' addresses to a user's private directory. Those transfers include message originator and all message addressees.

[1] This allows the messaging directory to be accessed by databases like Oracle and Microsoft SQL for applications in workflow and EDI solutions.

- The system shall support different organizations and individuals with various attributes (fields) in the directory. Most FAA organizations require a single directory, at least from the users' view. The message system directory shall be able to support organization unique extensions to the directory.
- The directory service shall provide robust support to enable digital signatures and security capabilities. See Section 6.7, Security, for additional information.
- In order to prevent bottlenecks in maintaining directory contents and to avoid organizational disputes over data ownership, the directory system shall support attribute-level access controls. Those controls shall allow data owners to update only those attributes for which they are responsible and provide users the ability to search and view only those attributes for which they hold authority to view.
- The directory system and certificate path processing capabilities shall provide for the use of trusted parties and hierarchically superior certificate authorities for verification endorsements, authentication services, and trusted date/time stamping.
- Stand-alone users needing to synchronize their directories shall have the option to perform delta updates or a full directory replacement with the option for either type of download to be via compressed files to minimize time on-line.

6.5 Delivery and Message Notification

- Non-Delivery Notification
  - ➢ The system shall automatically provide users with notification of message non-delivery or delay beyond the delivery performance of Section 5.6. The delivery time of the notification itself shall meet the same delivery performance requirements for the priority level of the message in question. This notification must be capable of being disabled, enabled, or selectively initiated by the user on specific messages. The system shall clearly describe the reason for non-delivery or not meeting the established service level.
  - ➢ The system shall provide a non-messaged based, single view to determine delivery notification and receipt, such as a unique icon that is displayed next to the sent message.
- Inadvertent Spam Control - The system shall be able to filter address lists, list-servers, and newsgroups in order to avoid loop processing in which the automatic response capability responds to its own message. This capability shall support notification that the receiver is delegating their mail to be accessed by another user.

6.6 Interoperability

The system shall provide interoperability with external organizations' messaging, directories, Public Key Infrastructures, and calendaring/scheduling applications, if they are standards-based. The standards of which the agency is currently aware are listed in Section 6.8.

6.7 Security

- All security requirements from phase 1 apply to the security requirements in phase 2. The requirements below are additional security requirements.
- The vendor shall comply with detailed requirements, to be specified, in a protection profile developed in accordance with ISO 15408.
- The electronic messaging capability shall support digital signatures, encryption, and virus prevention. The security capability shall be based on existing non-proprietary standards.
- The author shall have the ability to restrict the reader's ability to copy, print or forward a message if the author has identified it to be restricted.
- The system shall support "single sign-on" capabilities, so that users do not have to enter multiple or repetitive IDs and passwords to gain access to different functions of the messaging system (i.e., not requiring additional user IDs/passwords). Databases and documents within the data store shall be integrated with messaging security login processes and use single sign-on authentication.
- Knowledge management applications (integrating databases and documents within the data store) shall be integrated with messaging and document management and support single-sign-on authentication and access controls.
- The system will not require repeated entry of user ID/passwords for digital signatures during a single continuous active session not to exceed 30 minutes.
- The system shall maintain the encrypted state of incoming encrypted mail and not allow routine system administrator de-encryption of such mail. However, the system must support de-encryption by a non-recipient in a controlled manner by individuals or applications (in the case of virus checking of encrypted payloads) that have specific authorizations to do so.
- Portions of an e-mail message (i.e., in forms) shall be able to be restricted from viewing.
- Due to multiple operating systems using the messaging system, the "authentication" should not be tied to the operating system. It should be "certificate" based (X.509) and not be dependent on any operating system's security.

6.7.1 Address/Message Filtering

The system shall have the capability of filtering message traffic based upon sender or receiver addresses, message title, or message content. The purpose of the requirement is to provide users the capacity for blocking spam, denial of service attacks, and preventing the exchange of information with individuals or sites that are clearly inappropriate for the conduct of agency business.

6.7.2 Certificate/Key Issuance

The system shall be able to generate digital certificates and issue appropriate keys within 15 minutes from a central authority.

6.7.3 Revocation

The system shall be able to process certificate revocations within 5 minutes of notification and be able to publish Certificate Revocation List updates within 15 minutes of revocation. The system shall be able to respond to an Online Certificate Status Protocol (OCSP) status request within 5 seconds.

6.8 Technical Requirements - Standards

- X.500 directory access (1993 version) - Protocol for managing on-line directories of users and resources. It can be used to support X.400 and other messaging systems, but it is not restricted to e-mail usage. It provides a hierarchical structure that fits the world's classification system: countries, states, cities, streets, houses, families, etc. The goal is to have a directory that can be used globally.
- Secure Multipurpose Internet Mail Extensions (S/MIME) - A version of MIME that adds encryption for secure transmission.
- X.509 Public Key Certificates (X.509-based PKI) - A specification for digital certificates that is the digital equivalent of an ID card used in conjunction with a public key encryption system. Trusted third parties, known as certificate authorities (CA's), issue a digital certificate after verifying that a public key belongs to a certain owner. The digital certificate is actually the owner's public key that has been digitally signed by the CA.
- Lightweight Directory Access Protocol (LDAP) - Protocol used to access a directory listing. It is used to query an LDAP compliant directory (including an X.500 directory). It is expected that LDAP will provide a common method for searching e-mail addresses on the Internet, eventually leading to global white pages.
- Wireless Application Protocol (WAP) - WAP is a specification for a set of communication protocols to standardize the way that wireless devices, such as cellular telephones and radio transceivers, can be used for Internet access, including e-mail, the World Wide Web, newsgroups, and Internet Relay Chat. While Internet access has been possible in the past, different manufacturers have used different technologies. In the future, devices and service systems that use WAP will be able to interoperate.
- VCard - Standard format for an electronic business card from Versit that is being incorporated into an Internet Engineering Task Force (IETF) standard. It includes fields for photos, sound, and company logos.
- VCalendar - Protocol for exchanging calendaring and scheduling information from Versit that is being incorporated into an IETF standard.

6.9 Training

- Training at the system administrator level, to include, but not limited to, administration, management, configuration, tuning, and troubleshooting of the message store and its components, is required.

- User training shall be delivered on a timely basis to maximize learning transfer. The time elapsed between completion of training and the user's transfer to the new system shall not exceed 5 workdays.
- The training requirements shall also apply to stand-alone-based user client software. Because the stand-alone users may potentially be required to perform maintenance on their directory and message stores, additional training shall be provided for the unique needs of this type of user.

- **On-line Help**
  - ➢ On-line help shall be easily selectable and, to the maximum extent, be within the context of the task that a user is trying to execute.
  - ➢ On-line help shall have an index and search engine for quickly finding a subject and use hyperlinks and bookmarks to quickly display and save references to desired information.
  - ➢ On-line help shall be available for all tasks, functions, and features of the messaging application.
- **User Manuals**
  - ➢ A printed set of user manuals shall be provided to every FAA location. The vendor shall also provide administrator and user supporting documentation on a separate CD-ROM and provide a hypertext search engine for quickly locating topics, information, and tutorials as needed by the user.
  - ➢ Additionally, user manuals shall be accessible at each site in electronic form.
  - ➢ The FAA shall have rights to copy for its use all documentation provided by the vendor.
  - ➢ Electronic manuals shall be updateable and revisable by the vendor or the FAA.
  - ➢ Separate, easily transportable manuals shall be available for stand-alone users that include unique maintenance functions.
- **On-line Tutorials**
  - ➢ Tutorials shall cover the most common tasks and be interactive in order to maximize learning transfer. Tutorials shall provide hypertext on-line help files. The user shall have the ability to bookmark, or preserve, a stopping point within the tutorial and easily return to that section.
  - ➢ Each major function of the messaging application shall be accompanied by an on-line tutorial showing visually (movie or animation) how to perform the task.
  - ➢ Web-enabled documentation shall have similar features.

7 PHASE III MESSAGING SYSTEM REQUIREMENTS

7.1 Messaging System Features

For internal FAA messages, the system shall provide the ability to recall a sent message if the recipient has not opened the message or, for stand-alone users, has not synchronized or downloaded from their message server. For messages that are addressed to individuals beyond the FAA, the system shall provide the ability to recall a sent message as long as it is still within the agency routing system.

7.2 Access/Connectivity

- Unified Inbox - The system shall be able to provide standards-based support, when available, for external mail systems and gateways to external communications systems. Capabilities to be supported include:
  - ➢ Text-to-voice, voice-to-text
  - ➢ Fax-to-text, fax-to-inbox, message-to-fax
  - ➢ Voice mail handling
- External Messaging System Connectivity - The user shall have the option to specify a mandatory route and be provided a list of interconnections. This feature may also be used for problem resolution/escalation.

7.3 Collaboration/Workflow

The system shall support the adoption of open standards, when available, that expand the use of collaboration technologies to external organizations. The intent is to provide a capability to streamline practices and processes with industry organizations the FAA has regulatory oversight of, with other regulatory bodies (domestic, state, local, and foreign), and with other aerospace industry stakeholders.

- Whiteboard/Networking and Conferencing - The system must support the on-line creation, editing, and saving of presentations, using dedicated presentation applications and simple drawing tools (a shared whiteboard), in a multi-user conference.
- Integrated Video - The system must support the creation, editing, and distribution of video content as an attachment to messages for “video mail” and distance learning. In addition, it must support real-time video transport as an adjunct to instant messaging and on-line conferencing.

7.4 Directory

The directory service shall support security protocols, based upon PKI standards, which have the ability to interoperate with non-messaging system applications. Examples include Virtual Private Networks, entry control systems, Enterprise Resource Planning systems, and single sign-on access to other applications, networks, firewalls, and extranets.

7.5 Delivery and Message Notification

For two-way text pagers, user controlled pager notification of new message arrival shall be granular enough to allow the user to filter out unimportant messages or base notification on the message priority or sender.

7.6 Message Retention and Organization

- National Archives and Records Administration (NARA) - NARA requires ability to retain/store messages that are official records. Recent rulings have nullified a previous judgment that required the digital form of messages be retained. While the current regulatory requirement can be met by printing applicable messages, including their routing information and attachments, and storing them in a physical record-keeping system, the FAA has chosen to continue toward meeting the regulatory requirements via digital means. Therefore, the system shall support the NARA General Records Schedules provisions for maintaining and protecting relevant records. There shall be a secure, indexable, retrievable location for these records, accessible to all system users. Ideally, the system shall be configurable in such a way that users can activate a decision support capability that assists them in properly classifying the message (record) for preservation, including the establishment of a destruction time.
- Freedom of Information Act (FOIA) - Since electronic messages are subject to the FOIA, the system shall provide an effective means of searching and retrieving information throughout the enterprise system.

7.7 Interoperability

- Fax Support - Many contemporary messaging systems have the capability to integrate fax support. Currently, these are point solutions and proprietary in nature, although standards work is underway which is likely to influence vendors. The system shall support and adopt open standards protocols for the following, when available:
  - ➢ Receiving faxes by e-mail
  - ➢ Sending faxes from the messaging system
- Support for Electronic Data Interchange - The system shall support, via its workflow capabilities, the ability to interface with Electronic Data Interchange and Electronic Commerce services and support Message Transfer Agents.

7.8 Performance Levels

The system will provide a means for a message sender to query as to the status of their sent messages based upon criteria such as addressee, subject, or sent within a selected date span. This requirement does not have to be supported until after all FAA users have migrated to the new system. Thereafter, the system will support message tracking to those addressees within the FAA's messaging system.

7.9 Training

- Training at the system administrator level to include, but not limited to, administration, management, configuration, tuning, and troubleshooting of the message store and its components is required.
- User training shall be delivered in a manner that maximizes learning transfer. The time elapsed between completion of training and the user's transfer to the new system shall not exceed 5 workdays.
- The training requirements shall also apply to stand-alone-based user client software. Because the stand-alone users may potentially be required to perform maintenance on their directory and message stores, additional training shall be provided for the unique needs of this type of user.
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